

LI.—On a Collection of *Odonata* (Dragonflies) from
Panama. By W. F. KIRBY.

[Plate XV.]

IN the course of last year I received a consignment of *Odonata* for the Natural-History Museum from Mr. Charles H. Dolby-Tyler. They were all taken by himself between April 1 and May 15, 1898, at La Chorrera, about 20 miles north of Panama. Accompanying them were short descriptions, "taken in most cases from two or three specimens while the insect was alive, and jotted down in my note-book. . . . Among the unnumbered duplicates you will find two, or possibly three, species not included in the series."

The numbers on the specimens run from 1 to 20; but as the sexes of several species bore different numbers, the total number of species (including those not numbered) is not more than 21. Several of these are of considerable interest and some appear to be new; and hence I have thought it would be useful to give a list of the whole, printing Mr. Dolby-Tyler's descriptions of the living insects exactly as I received them, between inverted commas, and adding any remarks of my own which seemed to be necessary. As usual, many more males than females were collected.

The list of species is as follows:—

Libellulidæ.

LIBELLULINÆ.

- Miathyria*, Kirb.
marcella, *De Selys*.
Perithemis, Hagen.
domitia, *Dru.*
Trithemis, Brauer.
pulla, *Burm.*
Tyleri, Kirb. (sp. n.).
Orthemis, Hagen.
ferruginea, *Fabr.*
Dythemis, Hagen.
Broadwayi, Kirb.
Mucrothemis, Hagen.
vulgipes, *Calv.* (?)
Uracis, Ramb.
quadra, *Ramb.* (?)
Lepthemis, Hagen.
vesiculosa, *Fabr.*
Mesothemis, Hagen.
verbenata, *Hagen.*
Erythemis, Hagen.
peruviana, *Ramb.*
Micrathyria, Kirb.
Hagenii, Kirb.
Diplacodes, Kirb.
minuscule, *Hag.*

Æschnidæ.

GOMPHINÆ.

- Gomphoides*, *De Selys*.
appendiculatus, Kirb. (sp. n.).
Cyclophylla, *De Selys*.
obscura, Kirb. (sp. n.).

Agrionidæ.

AGRIONINÆ.

- Heterina*, *De Selys*.
occisa, *De Selys*.
caja, *Druy* (?).

CENAGRIONINÆ.

PSEUDOSTIGMATINA.

- Mecistogaster*, Ramb.
ornatus, *Ramb.*

NORMOSTIGMATINA.

- Argia*, Ramb.
tinctipennis, *De Selys*.
orichalcea, *De Selys*.
pulla, *De Selys*.

Miathyria marcella.

Libellula marcella, De Selys, Ramon de la Sagra, Hist. Cuba, Ins. p. 452 (1857).

(♂, no. 1.) "Apex of eye red, with a purple tint, the remainder infuscated purple. Epicranium metallic purple. Ante- and postclypeus olivaceous. Labrum fuscous. Dorsal aspect of mesepisterna and notum bluish black.

"Tergum of abdomen ochreous. Tergites 1-3 fuscous, 4-9 ochreous, edged with black. Median line black, growing gradually broader from base up to the ninth tergite, where the ochreous ground appears only as two lateral spots. Tenth tergite and cercopoda black; tergites 4-8 with two fuscous marks towards the apex of each tergite, these markings on the ninth becoming merged into the median line."

Three male specimens.

Perithemis domitia.

Libellula domitia, Dru. Ill. Ex. Ent. ii. pl. xlv. fig. 4 (1773).

(♂, no. 3.) "Apex of eye fuscous; middle third with a faint purplish tint horizontally; lower third from the epicranial suture downwards, together with the clypeus and labrum, olive-green. Epicranium yellowish green.

"Dorsal aspect of mesepisterna and notum dark green, faintly æneous.

"Abdominal tergites olive-green, marked diagonally towards the outer edges with fuscous fasciæ, bordered laterally with light brown. Edges of tergites ochreous. Cercopoda olive-green."

Six male specimens.

Trithemis pulla.

Libellula pulla, Burm. Handb. Ent. ii. p. 855. n. 41 (1839).

(♂ adult, no. 17.) "Apex of eye rufescent, balance cinereous. Epicranium, clypeus, and labrum rufescent. Dorsal aspect of mesepisterna bronzy green. Notum dark green.

"Tergum of abdomen rufescent. Tergites 1-3 greenish, 4-8 with diagonal luteous markings from outer angle at base of each tergite inclining towards the median line, 9-10 testaceous. Cercopoda red."

(♂ semiadult, no. 4.) "Eyes piceous, with dark crimson apices. Epicranium, clypeus, and labrum crimson.

"Dorsal aspect of mesepisterna, notum, and abdominal tergites dark crimson. Median line of tergum black. Edges

of tergites black. Cercopoda dark crimson, tipped with black."

(♀, no. 10.) "Apex of eye reddish brown, balance greyish green. Epicranium, clypeus, and labrum olivaceous. Dorsal aspect of mesepisterna and notum olive-green.

"Tergal aspect of abdomen rufo-flavescent, marked longitudinally towards the outer edges of each tergite and near its base with yellow. Median line and edges of tergites black. Cercopoda tipped with black."

Twelve specimens in all.

Trithemis Tyleri, sp. n. (Pl. XV. fig. 1.)

(♂, no. 13.) "Apex of eye piceous, balance bluish grey. Postclypeus olivaceous. Epicranium, anteclypeus, and labrum dark olivaceous generally.

"Dorsal aspect of mesepisterna, notum, and abdominal tergites 1-3 dark infumated green, 4-10 fuscous, bordered with black. Cercopoda olivaceous."

Closely allied to *T. umbrata*, Linn.; but in that species the purplish-brown band lies between the nodus and the stigma, whereas in *T. Tyleri* it extends from about the triangle of the fore wings to halfway between the nodus and the pterostigma, and the lower basal cell is slightly clouded as far as the base. The hind wings are clouded from the base to the outer level of the band of the fore wings, but the basal part of the hind wings is paler than the rest of the clouded portion, especially in the female.

Described from three males and two females.

Orthemis ferruginea.

Libellula ferruginea, Fabr. Syst. Ent. p. 423. n. 19 (1775).

(♂, no. 14.) "Apex of eye purplish, balance dark bluish. Epicranium crimson, with a tinge of purple. Clypeus and labrum rufescent.

"Dorsal aspect of mesepisterna and notum infumated purple.

"Tergum of abdomen bright crimson."

(♀, no. 16.) "Apex of eye rufescent, balance grey.

"Front olivaceous.

"Dorsal aspect of mesepisterna fuscous, with a pale green median line. Notum fuscous, with a pale green median line, which extends to the fourth abdominal tergite, where it becomes somewhat flavescent and constricted; it then narrows down to the seventh, where it is scarcely perceptible. Tergites 8-10 and cercopoda somewhat rufescent."

Two males and two females sent.

Dythemis Broadwayi.

Dythemis Broadwayi, Kirb. Ann. & Mag. Nat. Hist. (6) xiv. p. 227 (1894).

Dythemis sterilis, Calv. (or Hagen?), Proc. California Acad. (2) iv. p. 522, pl. xvi. figs. 52-55 (1895).

Dythemis velox (Hagen), var. *sterilis*, Calv. Proc. Boston Soc. Nat. Hist. xxviii. p. 310 (1898).

(♂, no. 7.) "Apex of eye red, balance greyish green. Epicranium fulvous; clypeus and labrum olivaceous.

"Dorsal aspect of mesepisterna green, with two darker-hued metallic fasciæ on either side of, separated from, and parallel to the median line. Notum green, with black border.

"Abdomen black, with green markings. In tergite 2 the markings occupy nearly all the surface, in 3-7 they are acutely triangular and basal, running parallel to and on either side of the median line; they become nearly obliterated on the eighth tergite. Cercopoda black."

Two specimens.

I provisionally retain my name *D. Broadwayi* for this species or variety, for Hagen's name of *D. sterilis* was intended to replace *tessellata*, Ramb. (nec Burm.), from Buenos Aires; and in the absence of specimens from that locality agreeing with Rambur's *tessellata*, and to which Hagen's name of *sterilis* is alone primarily applicable, I do not care to apply it to specimens from widely different localities without further evidence.

Macrothemis vulgipes (?).

Macrothemis vulgipes, Calvert, Proc. Bost. Soc. Nat. Hist. xxviii. p. 320 (1898).

(♀, no. 8.) "Apex of eye reddish brown, bordered with glaucous, lower portion olive-green. Epicranium fuscous near suture at base of ocelli-bearing sclerite; clypeus and labrum olivaceous.

"Dorsal aspect of mesepisterna fuscous, with two green fasciæ running parallel to, separate from, and on either side of the median line. Thorax fuscous, with green markings.

"Tergum of abdomen black. Tergites 1-5 with lateral longitudinal green markings, 7 with two green markings."

Two specimens, agreeing with Prof. Calvert's description, except that the wings are clear hyaline, with no yellow tinge except at the base, and that the double row of post-triangular cells on the fore wings only increases to three on the hind margin instead of to four; in one specimen, indeed, there is only one row of these cells on the margin itself. On the fore wings the arculus corresponds with the second antenodal

cross-nervure on the fore wings, and rises considerably beyond it on the hind wings.

It is quite possible that Mr. Dolby-Tyler's insect may be distinct from *M. vulgipes*, Calv., but I do not like to separate them until the allied forms are better known.

Two specimens.

Uracis quadra (?).

Libellula quadra, Ramb. Ins. Névr. p. 31, pl. ii. fig. 5e (1842).

(♀, no. 12.) "Apices of eyes green, balance cinereous, together with the epicranium, clypeus, and labrum, the last-mentioned somewhat olivaceous.

"Dorsal aspect of mesepisterna black, with rugose flavescent markings transversely. Notum grey. Tergum of abdomen deep fuscous, with somewhat flavous markings.

"Tips of wings fuliginous."

Nine specimens in the collection, belonging to both sexes. They agree fairly well with Rambur's figure and description of *U. quadra*, except that the triangle of the hind wings is followed by only two rows of cells increasing, not three, as in Rambur's figure. It may be noted that the true *U. quadra*, Ramb., is the type of his genus *Uracis*; not *imbuta*, Burm., which is a perfectly distinct species, with a pruinose blue male. The species which I here call *U. quadra* may be known by the upper surface of the thorax being finely and transversely striated with brown and black.

Leptthemis vesiculosa.

Libellula vesiculosa, Fabr. Syst. Ent. p. 421. n. 7 (1775).

(♂, no. 11.) "Eyes green, rufescent at apices, remainder greyish. Vertex, ocelli-bearing sclerite, epicranium, clypeus, and labrum verdant green.

"Dorsal aspect of mesepisterna, notum, and abdominal tergites 1-3 verdant green; tergites 4-7 green with black apices, 8-10 black. Cercopoda green.

"Pterostigma green."

One male specimen.

Mesothemis verbenata. (Pl. XV. fig. 2.)

Leptthemis verbenata, Hagen, Neur. N. Amer. p. 162 (1861).

(No. 5.) "Apex of eye rufescent, remaining portion grey with a greenish tinge. Epicranium, clypeus, and labrum olivaceous.

"Dorsal aspect of mesepisterna, notum, and abdominal tergites 1-3 dull green, 3 to last olivaceous, with fulvous

markings, which become flavescent towards the outer edges; these last are black.

"Tergites 8-9 somewhat rufescent. Median line black."

There are seven males and one female in the collection, and although one of the males bears the no. 5, the above description was probably taken from the female, to which it seems to be much more applicable.

Lepthemis verbenata, Hagen, is usually considered to be a mere synonym of *Mesothemis attala*, Selys; but, as far as I can tell without actually examining Hagen's types, the species sent by Mr. Dolby-Tyler is the true *verbenata* and has every appearance of a *Lepthemis*, especially as Hagen understood that genus in 1861. It has all the most important structural characters of *M. attala*, which it much resembles, but the abdomen is much longer and more slender, segments 4-7, though slightly decreasing in length, being about four times as long as broad, whereas they are less than twice as long as broad in *M. attala*. The cross-nervures are also less by one or two in *verbenata*, none of the specimens before me having more than 14, and often only 13, antenodal cross-nervures on the fore wings, while all our *M. attala* have 15. The female corresponds fairly with Hagen's description of *L. verbenata*; the males are the dark form which he describes. The latter, however, are not quite so dark as Hagen's description might imply, for the base of the mandibles and the sides of the labrum are testaceous, and the femora are lined with red.

This is one of the most interesting species in the collection.

I have just heard from Prof. Calvert that he also regards the two species as distinct.

Erythemis peruviana.

Libellula peruviana, Ramb. Ins. Névr. p. 81 (1842).

(♂, no. 2.) "Eyes bluish black. Ocelli, epicranium, clypeus, and labrum black.

"Dorsal aspect of mesepisterna and notum dark blue, approaching black, this colour extending to the middle of the third abdominal tergite. Apical half of third tergite, tergites 4-10, and cercopoda bright crimson."

(♀, no. 15.) "Eyes greyish. Epicranium posteriorly dirty white, bordered anteriorly with black. Clypeus and labrum olivaceous.

"Dorsal aspect of mesepisterna pale green, bordered laterally with fuscous. Notum pale green.

"Tergum of abdomen pale green, bordered laterally with fulvous, and this exteriorly with ochreous."

Four males and two females in the collection.

Micrathyria Hagenii.

Dythemis didyma, Hagen (nec De Selys), Neur. N. Amer. p. 165 (1861).

Micrathyria Hagenii, Kirb. Cat. Neur. Odon. p. 41 (1890).

(♂, no. 6.) "Eyes bright green, clouded with blue. Ocelli black. Epicranium, clypeus, and labrum dirty white.

"Dorsal aspect of mesepisterna bright green, with black fasciæ. Notum bluish black.

"Tergites of abdomen black; tergites 2-5 with interrupted green markings extending from the base of each tergite over two thirds of its length, and forming apparently two markings on each side of the median line. The apical half of these markings becomes obliterated in the fifth, and in the sixth there are traces only of their basal portions; seventh with two oblong markings, concolorous with the others, occupying two thirds of the surface from the base."

Four males. The interalary portion of the thorax above is pruinose. They may represent a local form of *M. Hagenii*. On the fore wings there are only 8 antenodal cross-nervures (the last not continuous) and 6-8 postnodals. The hinder segments are considerably enlarged. In most points they agree very well with Hagen's description.

Diplacodes minuscula.

Libellula minuscula, Ramb. Ins. Névr. p. 115 (1842).

Diplax minuscula, Hag. Neur. N. Amer. p. 183 (1861).

(Immature ♂, no. 9.) "Apex of eye rufescent, remaining portion green. Epicranium fuscous, with a dark metallic blue reflection. Clypeus olivaceous and labrum blackish towards front.

"Dorsal aspect of mesepisterna and notum fulvous. Abdominal tergites flavous, with black edges, and concolorous at base and apex and on either side of median line, forming two fenestra.

"Cercopoda flavescent."

A single specimen only.

Gomphoides appendiculatus, sp. n. (Pl. XV. fig. 3.)

(♂, no. 18.) "Description lost."

Long. corp. 50 millim.; exp. al. 71 millim.; long. pter. 4 millim.

Male.—Head and thorax reddish chocolate, head with the occiput (?) (discoloured), a square spot in front of it between the eyes; a transverse band before the frontal ocellus, the

sides of the face above the base of the mandibles, and the lower mouth-parts black; borders of labrum and mandibles black, two yellow dots on the labrum. Prothorax with a short oblong yellow spot in the middle. Mesothorax with a yellow collar, divided in the middle; a transverse expanding yellow median line, followed by a series of yellow spots between the wings as far as the base of the abdomen, and a short oblique yellow stripe on each side, followed by a yellow spot opposite the base of each fore wing. A very broad yellow stripe beneath each wing; metapectus with two oblique yellow stripes. Abdomen with the first six segments with oblong yellow markings at their base on the sides: the median line above is mostly yellow nearly to the extremity, bordered with blackish on the sides and sutures; on the seventh segment the yellow stripe is interrupted, being followed by a detached spot; the last three segments are expanded, dull yellow above, with the sides brown, and the terminal carinae black. Lateral appendages of second segment yellow. Anal appendages as long as the last two segments, yellow, black at the base and tips, curved inward; a small black tooth on the upperside beyond the middle, and the tips upcurved. Lower appendages brown, one fourth as long as the others, diverging, slender, pointed; lowest appendage broader, longer, directed obliquely downwards, and truncated at the extremity. Legs black, femora yellowish below and serrated. Wings hyaline: fore wings with 20 antenodal cross-nervures and 11 or 12 postnodals; 2 supratrangular nervules on all the wings; pterostigma brownish ochreous, between black nervures; fore wings with the triangle of 2 or 3 cells, followed by two rows of cells, increasing, subtriangular space (lower triangle of De Selys) divided by a nervure: hind wings with 13 or 14 antenodal and postnodal cross-nervures, triangles traversed, followed by one row of 3 cells and then by several of 2, increasing; anal triangle of 4 cells; subtriangular space divided.

I suspect that this insect may be the male of *G. bifasciatus*, Hagen, described from Tehuantepec, but cannot put them together without authority.

One specimen only.

Cyclophylla obscura, sp. n. (Pl. XV. fig. 4.)

(♀, 0.) No description.

Long. corp. 55 millim.; exp. al. 76 millim.; long. pter. $4\frac{1}{2}$ millim.

Uniform dark reddish brown, inclusive of neururation; sides

of mandibles and lower mouth-parts paler; tips of mandibles, tibiae, and tarsi black; seventh and eighth segments considerably widened, the seventh, which is twice as long as the eighth, gradually widened, nearly from the base; ninth and tenth segments successively narrower, about as long as broad; anal appendages as long as the tenth segment, conical, porrected, pointed at the tips.

Wings hyaline; pterostigma ochreous yellow, between black nervures, covering six or seven cells; one supratrangular nervure on each wing: fore wings with 20-21 antenodal and 13-14 postnodal cross-nervures; triangle formed of three cells, followed by one or two rows of three cells and then several of two, increasing; lower triangle traversed: hind wings with 13-17 antenodals and 15-17 postnodals; triangle traversed; lower triangle free.

One specimen.

Very few females of this genus have been described; but the present specimen does not seem to agree with any described male.

Heterina occisa.

Heterina occisa, De Selys, Syn. Cal. p. 44 (1853); Mon. Cal. p. 143 (1854).

One well-marked male, with no special number.

Heterina caja (?).

? *Libellula caja*, Drury, Ill. Ex. Ent. ii. pl. xlv. fig. 2 (1773).

Calopteryx caja, pt., Ramb. Ins. Névr. p. 226 (1842).

Heterina caja, De Selys, Syn. Cal. p. 32 (1853); Mon. Cal. p. 104 (1854).

Heterina hera, Hagen, De Selys, Il. cc. p. 32 (1853); p. 106 (1854).

(♂, no. 19.) "Eyes black, lower and outer portion grey. Epicranium with a red fascia horizontally (transversely?) in front of ocelli, and separated from the anterior portion, which is fulvous, by a black line. Postclypeus purplish black. Anteclypeus olivaceous. Labrum grey. Scape of antennæ grey.

"Dorsal aspect of mesepisterna crimson, divided by the black median line. Thorax and abdominal tergites 1-5 fuscous; fifth tergite much darker, and merging into the colour of tergites 6-10 and cercopoda, which is dark green."

A series of twenty-two specimens, males and females. If this insect ultimately proves not to be the true *H. caja*, Dru., Hagen's name of *H. hera* (omitted in my Catalogue) must be adopted for it.

Mecistogaster ornatus.

Mecistogaster ornatus, Ramb. Ins. Névr. p. 238 (1842).

One specimen only. No number attached.

Argia tinctipennis.

Argia tinctipennis, De Selys, Bull. Acad. Belg. (2) xx. p. 396 (1865).

Two males, without special number.

I find the name of this species is misprinted *tractipennis* in my Catalogue of Odonata.

Argia orichalcea.

Argia orichalcea, De Selys, Bull. Acad. Belg. (2) xx. p. 408 (1865).

Agrion cupreum, var., Hag. Neur. N. Am. pp. 97, 312 (1861).

(♂, no. 20.) "Front hemisphere of eye bright red; apical half posteriorly black, lower posterior half grey. Epicranium fuscous. Clypeus brown-æneous, same as dorsal aspect of mesepisterna; notum blue.

"Tergum of abdomen blue, with an annular black fascia at the apex of each tergite. Tergite 8 almost entirely black."

Two males; and a very dark-coloured female, possibly not belonging to the same species.

Argia pulla.

Argia pulla, De Selys, Bull. Acad. Belg. (2) xx. p. 410 (1865).

Four specimens, without special number.

EXPLANATION OF PLATE XV.

Fig. 1. *Trithemis Tyleri*, sp. n., p. 364.

Fig. 2. *Mesothemis verbenata*, Hagen, p. 366.

Fig. 3. *Gomphoides appendiculatus*, sp. n., p. 368. *a, b*, anal appendages.

Fig. 4. *Cyclophylla obscura*, sp. n., p. 369.

LII.—*Descriptions of Two new Moths collected by Dr. Christy on the Upper Niger.* By EMILY MARY SHARPE.

Family Saturniidæ.

Bunea Christyi, sp. n.

Allied to *Bunea phædusa* (Drury), but at once distinguished by the very large ocellus on the fore-wing, which is similar to that on the hind-wing in markings and colour.